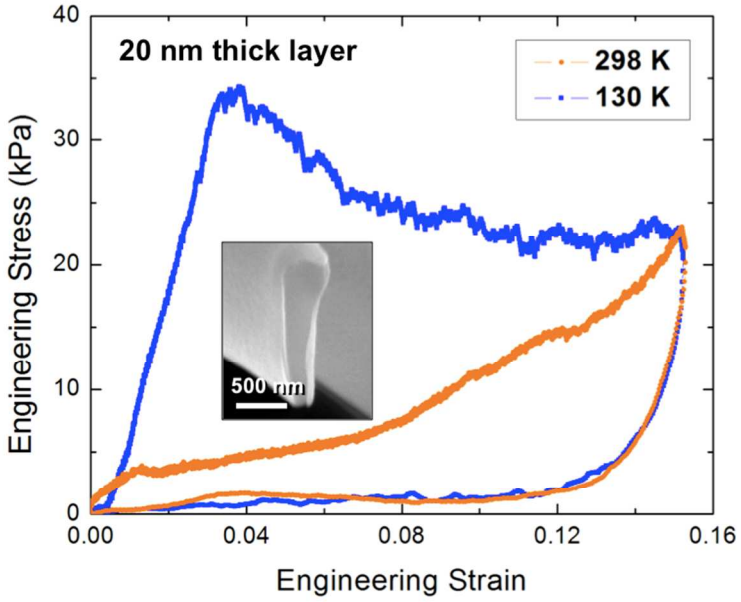
Supplementary Information 7



The stress-strain data of 20 nm thick MG nanolattices at room temperature and 130 K.

During loading, some individual nanolattice members suffered local fracture and/or local plastic deformation, causing the dissipation of the strain energy, with the remaining members – which become fully load-bearing - still exhibiting purely elastic behavior. The nanolattices recover to their original shape during unloading because the nanolattice is a relatively over-constrained mechanical system. As a result of all of these processes, the stress-strain data of nanolattices can exhibit the nearly full shape recovery with a loss of strain energy. So, there is no anelasticity here.